CLAIMS

1. An electrochemical display comprising a plurality of signal lines and a plurality of scan lines disposed in a row direction and a column direction on a substrate, and pixel circuits provided at intersection portions of said signal lines and said scan lines, said pixel circuits impressing a voltage on pixel electrodes disposed in display regions of pixels so as to display an image through deposition and dissolution of a metal, wherein

gradation display is performed by controlling the time when said pixel circuits impress on said pixel electrodes a deposition voltage for depositing said metal.

2. The electrochemical display as set forth in claim 1, wherein said deposition voltage is constant for said pixels.

3. The electrochemical display as set forth in claim 1, wherein the density of a current caused to flow through said pixel by said deposition voltage is not more than a predetermined value.

4. The electrochemical display as set forth in claim 1, wherein the density of a current caused to flow through said pixel by said deposition voltage is not more than 50 mA/cm^2.

5. The electrochemical display as set forth in claim 1, wherein said control of said time of impressing said deposition voltage is performed by dividing said voltage-impressing time into a plurality of sub-fields, and whether said deposition voltage is to be impressed or not is selected in each of said sub-fields.

6. An electrochemical display comprising a plurality of signal lines and a plurality of scan lines disposed in a row direction and a column direction on a substrate, and pixel circuits provided at intersection portions of said signal lines and said scan lines, said pixel circuits impressing a voltage on pixel electrodes disposed in display regions of pixels so as to display an image through deposition and dissolution of a metal, wherein

said deposition voltage is varied in a multiplicity of stages when said pixel circuits impress on said pixel electrodes a deposition voltage for depositing said metal.

7. The electrochemical display as set forth in claim 6, wherein the time of impressing said deposition voltage on said pixel electrodes is controlled.

8. The electrochemical display as set forth in claim 6, wherein said multiple-stage variation of said deposition voltage is performed by the steps of:

impressing an emphasis pulse voltage such that the density of a current flowing through said pixel is not less than a predetermined value; and

impressing a write voltage such that the density of a current flowing through said pixel is not more than a predetermined value.

9. The electrochemical display as set forth in claim 6, wherein said multiple-stage variation of said deposition voltage impressed on said pixel electrodes is performed by the steps of:

impressing an emphasis pulse voltage such that the density of a current flowing through said pixel is not less than 50 mA/cm^2; and

impressing a write voltage such that the density of a current flowing through said pixel is not more than 50 mA/cm^2.

10. An electrochemical display comprising a plurality of signal lines and a plurality of scan lines disposed in a row direction and a column direction on a substrate, and pixel circuits provided at intersection portions of said signal lines and said scan lines, said pixel circuits impressing a voltage on pixel electrodes disposed in display regions of pixels so as to display an image through deposition and dissolution of a metal,

wherein

the time when said pixel circuits impress on said pixel electrodes a deposition voltage for depositing said metal is divided into a plurality of sub-fields, and whether said voltage is to be impressed or not is selected in each of said sub-fields, whereby the time of impressing said deposition voltage on said pixel electrodes is controlled.

11. The electrochemical display as set forth in claim 10, wherein the duration periods of said sub-fields are different from each other.

12. The electrochemical display as set forth in claim 10, wherein said duration periods of said sub-fields are so determined that the ratios among the periods of said sub-fields are the n-th power of 2 (n is an integer).

13. The electrochemical display as set forth in claim 10, wherein a write stoppage period for which said deposition of said metal is stopped at all said pixels is provided after said sub-fields.

14. An electrochemical display comprising a plurality of signal lines and a plurality of scan lines disposed in a row direction and a column direction on a substrate, and pixel circuits provided at intersection

portions of said signal lines and said scan lines, said pixel circuits impressing a voltage on pixel electrodes disposed in display regions of pixels so as to display an image through deposition and dissolution of a metal, wherein

said pixel circuits each comprise:

a selection transistor for determining the pixel at which said metal is to be deposited;

a drive transistor for impressing said voltage on said pixel electrode; and

a voltage holding capacitance for holding a voltage impressed on a gate electrode of said drive transistor.

15. An electrochemical display comprising a plurality of signal lines and a plurality of scan lines disposed in a row direction and a column direction on a substrate, and pixel circuits provided at intersection portions of said signal lines and said scan lines, said pixel circuits impressing a voltage on pixel electrodes disposed in display regions of pixels so as to display an image through deposition and dissolution of a metal, wherein

each said pixel circuit comprises a first transistor, a second transistor, and a capacitor, and is connected to a common wiring and a ground wiring;

one of source-drain electrodes of said first transistor is connected to said signal line;

a gate electrode of said first transistor is connected to said scan line;

the other of said source-drain electrodes of said first transistor is connected to said gate electrode and one of electrodes of said capacitor of said second transistor;

the other of said electrodes of said capacitor is connected to said earth line;

one of source-drain electrodes of said second transistor is connected to said pixel electrode; and

the other of said source-drain electrodes of said second transistor is connected to said common electrode.

16. A drive method for an electrochemical display wherein

at the time of displaying an image through deposition and dissolution of a metal by impressing a voltage on pixel electrodes at pixels,

gradation display is performed by controlling the time when a deposition voltage for depositing said metal is impressed on said pixel electrode.

17. The drive method for an electrochemical display as set forth in claim 16, wherein said deposition

voltage is constant for said pixels.

18. The drive method for an electrochemical display as set forth in claim 16, wherein the density of a current caused to flow through said pixel by said deposition voltage is not more than a predetermined value.

19. The drive method for an electrochemical display as set forth in claim 16, wherein the density of a current caused to flow through said pixel by said deposition voltage is not more than 50 mA/cm^2.

20. The drive method for an electrochemical display as set forth in claim 16, wherein said control of the time of impressing said deposition voltage is performed by dividing said voltage-impressing time into a plurality of sub-fields, and selecting in each said sub-field whether said deposition voltage is to be impressed or not.

21. A drive method for an electrochemical display wherein

at the time of displaying an image through deposition and dissolution of a metal by impressing a voltage on pixel electrodes in pixels,

a deposition voltage impressed on said pixel electrodes for depositing said metal is varied in a multiplicity of stages.

22. The drive method for an electrochemical display as set forth in claim 21, wherein the time of impressing said deposition voltage is controlled.

23. The drive method for an electrochemical display as set forth in claim 21, wherein said multiple-stage variation of said deposition voltage is performed by the steps of:

impressing an emphasis pulse voltage such that the density of a current flowing through said pixel is not less than a predetermined value; and

impressing a write voltage such that the density of a current flowing through said pixel is not more than a predetermined value.

24. The drive method for an electrochemical display as set forth in claim 21, wherein said multiple-stage variation of said deposition voltage is performed by the steps of:

impressing an emphasis pulse voltage such that the density of a current flowing through said pixel is not less than 50 mA/cm^2; and

impressing a write voltage such that the density of a current flowing through said pixel is not more than 50 mA/cm^2.

25. A drive method for an electrochemical display

wherein

at the time of displaying an image through deposition and dissolution of a metal by impressing a voltage on pixel electrodes in pixels,

the time of impressing on said pixel electrodes a deposition voltage for depositing said metal is divided into a plurality of sub-fields, and whether a voltage is to be impressed or not is selected in each of the sub-field periods, whereby the time of impressing said deposition voltage on said pixel electrodes is controlled.

26. The drive method for an electrochemical display as set forth in claim 25, wherein the duration periods of said sub-fields are different from each other.

27. The drive method for an electrochemical display as set forth in claim 25, wherein the duration periods of said sub-fields are so determined that the ratios among the periods of said sub-fields are the n-th power of 2 (n is an integer).

28. The drive method for an electrochemical display as set forth in claim 25, wherein a write stoppage period for stopping said deposition of said metal at all said pixels is provided after said sub-fields.